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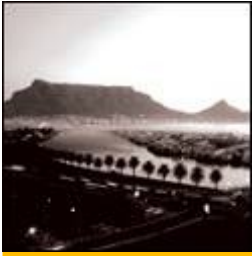
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Water Theft in the City of Cape Town:

An overview of problems and processes to counter theft

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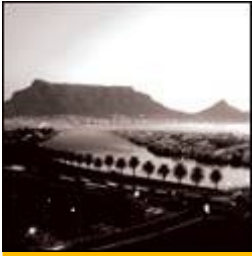
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BACK GROUND

- This presentation is more of an engineering assessment of potential water theft
- The Metro Water & Sanitation Services is currently developing structures that will interrogate consumer consumption patterns with a view to detecting possible water theft
- 650 000 full service connections
- Approx. 10 000 km water mains



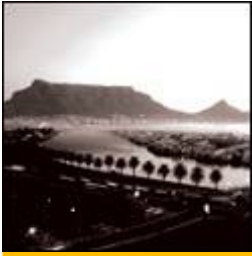
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DESCRIPTION OF METRO WATER RETIC

- 11 Treatment works feed into numerous reservoirs.
- Biggest supply zone is on the Cape Flats which is supplied directly from essentially 7 reservoirs, one of which operates as a balancing reservoir.
- Cape Flats Retic is designed around this operation.
- There are also numerous smaller supply zones, generally in the more hilly affluent areas.



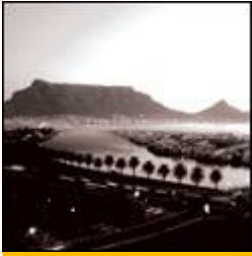
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DISTRICT METERING CONCEPTS

- In the recent past, the Metro was sub-divided into 6 areas with regards to bulk water consumption.
- The 6 areas did not reflect accurate unaccounted for water (UAW) figures, when compared with internal consumptions, attributed to metering errors.
- In smaller sub-districts monthly variations were large due to meter reading errors, meter access, estimated consumptions.
- Cases of deteriorating water quality were reported where water stagnated in the network pockets.



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CURRENT METHODS OF ACCOUNTING FOR WATER PRODUCTION (consumption in Cape Town)

- Comparison between water treated to water sold.
- Based on premise of most accurate metering at Treatment Plant and at consumer meter.
- Currently Unaccounted for Water (UAW) stands at 21.7% on a 12 month moving average.



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VALUE ATTACHED TO THEFT OF WATER

Water Tariffs

Domestic full – proposed tariffs 2009 / 2010

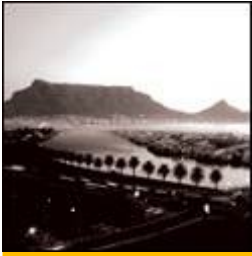
0-6 kl	R0.00
6 – 12 kl	R3.66
+12 – 20 kl	R7.81
+20 – 40 kl	R11.57
+40 – 50 kl	R14.29
+50 kl	R18.85

Volumetric Sewage Tariffs

Domestic full – proposed tariffs 2009 / 2010

0 – 4.2 kl	R0.00
+4.2 – 8.4 kl	R4.29
+8.4 – 14 kl	R9.12
+14 – 28 kl	R9.97
+28 – 35 kl	R10.46

- Steeply stepped tariff for Water Demand Management purposes.
- Within the single erf residential tariff a certain consumption bracket (40 – 50 kl) can have a value attached to theft of over R25 per kilolitre.
- Within the Commercial and Industrial tariff the value attached to theft can be over R15 per kilolitre.



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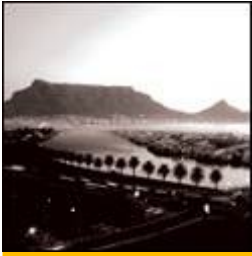


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ASSESSMENT OF WATER THEFT

- CAPE TOWN UAW = 21.7%
- Compare this with:

Brazil average	=	30%
Canada average	=	15%
Japan average	=	11%
USA average	=	12%
Australia average	=	15%
- In Cape Town consider that universal metering still has to be achieved (are mains flushing, contractor usage, informal settlements usage account for ?)
- We may guess, for Cape Town, at a few percent of water production (1% per month = R2m approximately) .



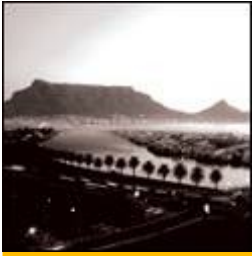
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THE WAY FORWARD – District metering areas (DMA's)

- Establishment of small District Metering Areas, approximately 5 000 properties.
- Ensure 100% actual meter reading (or as close as possible).
- Synchronize individual meter reading with bulk district meter.
- Difference between bulk meter readings and individual meter reading is UAW.
- Assess operational leakage (bursts, flushing, valve leakage, etc.).
- Balance could indicate quantum of theft.
- Detection of theft through inspection, leak detection operations and individual consumption trend comparisons.



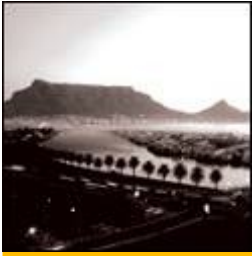
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EXAMPLES OF THEFT

- Theft of water by a farmer.
- Meter by-passing in high income area.
- Theft sites revealed in large housing estate water mains relays.



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Thank you and Questions